SFA Solution Life Cycle (SLC)
Process Guide

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Revision History

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.01	10/25/00	SFA Modernization Partner	Original Work in Progress release
.02	11/1/00	SFA Modernization Partner	Incorporation of core team comments to Vision and Executive Summary
.03	11/20/00	SFA Modernization Partner	Incorporation of core team comments
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1.0	2/12/01	SFA Modernization Partner	SDLC incorporation of SFA comments
1.0	10/15/01	Solution Acquisition Process Group (SAPG)	SLC deliverable formerly submitted to SFA leadership for final approval.

Release Schedule

There will be an annual release schedule with periodic updates based on changes accepted by the Change Control Process Group (CCPG).

Table of Contents

1. Introduction

This Guide documents the Department of Education's Student Financial Assistance (SFA) Solution Life Cycle (SLC). Formerly known as the SDLC (System Development Life Cycle), the framework has been updated, modified, and is now known as the SLC (Solution Life Cycle). It provides a baseline approach for solution acquisitions across SFA. SFA acquires IT solutions in order to meet business needs. Once a solution has been identified, SFA acquires the solution which could consist of a system, software, hardware, etc. The SLC is designed to be the process framework used by SFA to acquire the solution from planning to deployment and support.

This document and the overall process will continue to evolve through an "evergreening" process in order to remain as current and relevant as possible. It is SFA's intent to further develop the processes identified within this Guide as part of a continuous SFA process improvement program.

The SLC Process Guide brings together a variety of standard procedures, best practices, tools and reusable components to enable SFA personnel and contractors to better achieve successful solutions that are on time and on budget. These standard procedures may be modified as required to meet objectives specific to the most effective type of acquisition. Through the use of a standardized process, Project Managers will know what is expected of them and others. This will facilitate communication across the organization and will result in a more efficient and cost effective solution.

The SLC Process Guide is composed of five phases: vision, definition, construction, deployment and support. Depicted in Figure 1. The phases are tailorable so that some elements described within each phase may be skipped or abbreviated, should the solution require it. Regardless of what stage of development a project is in, the SLC can be utilized immediately. Life cycle process steps have been combined together into standard phases and these phases have been defined to help manage the risk inherent in any acquisition project, system development or enhancement project. The phases include commit points for decision-making as well as other forms of review. It is recognized that no project can accommodate all of the practices and processes described within this Guide due to various types of implementation such as Application Service Providers (ASP's), Commercial off the Shelf (COTS), or Rapid Application Development (RAD), elements of risk and other factors. Therefore, this Guide and its key processes should be used as a tool to add discipline to the acquisition and maintenance of SFA solutions.

Solution Life Cycle

Phases	Vision	Definition	Construction	Deployment	Support
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

Figure 1

The SFA has taken Key Process Areas from the Software Acquisition Capability Maturity Model (SA-CMM) and the Software Capability Maturity Model (SW-CMM) and merged the most applicable practices from each, to form the SFA SLC. This tailored framework is expected to provide maximum benefit to SFA and address specific business needs.

The six chosen KPAs align with different phases of the SLC. The six KPAs are:

Software Acquisition CMM

- Solution Acquisition Planning (SAP)

- Solution Acquisition Project Management (SAPM)

- Requirements Development and Management (RDM)

- Transition to Support (TTS)

Software CMM
- Quality Assurance (QA)
- Configuration Management (CM)

Each KPA has been converted into a process guide, which further defines and develops repeatable processes and procedures to be followed. Additionally, a Security Process Guide has been developed to identify specific security requirements and activities conducted throughout the Solution Life Cycle. The following Diagram 2 depicts where each KPA and System Security support the Solution Life Cycle.

Solution Life Cycle

| Solution Acquisition Planning |
| Solution Acquisition Project Management |
| Requirements Development and Management |
| Transition to Support |

	Vision	Definition	Construction	Deployment	Support
Phases					
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

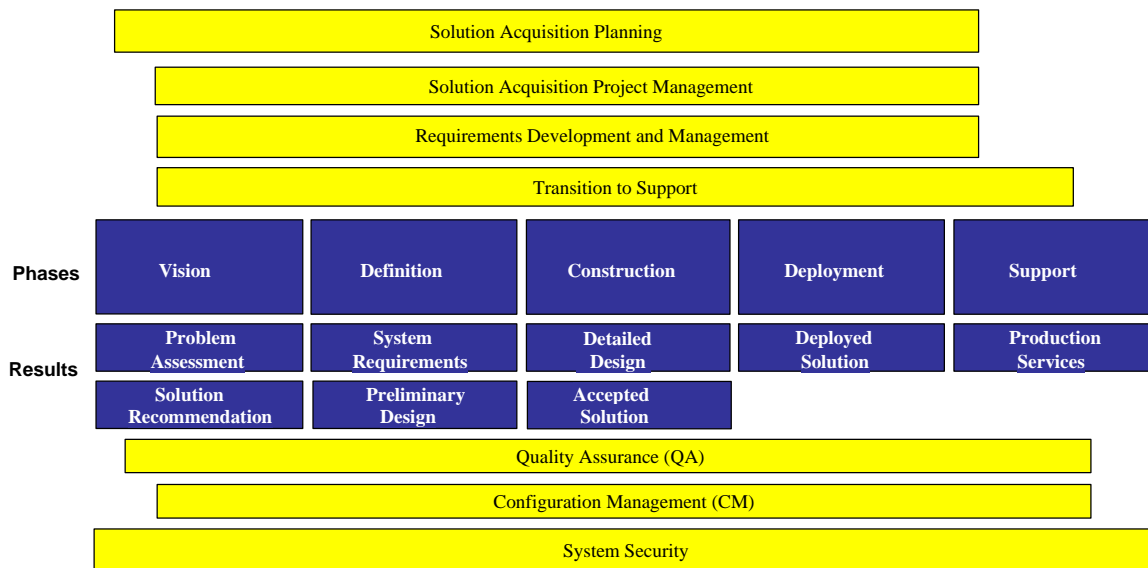| Quality Assurance (QA) |
| Configuration Management (CM) |
| System Security |

Figure 2

Each phase is guided by user and stakeholder input, and builds upon the outputs and products of the previous phase, with continual consideration of the objectives stated in the Business Case and activities documented in the Solution Acquisition Plan. This Guide is organized by the following topics in distinct sections for each of the five phases:

- Objective;
- Entry Criteria;
- Process and Outputs;
- Roles and Responsibilities;
- Exit Criteria; and
- Job Aids.

These topic areas will enable a project team to quickly look at the five phases within the Process Guide to assess what they need to accomplish. Some projects may develop a solution in several iterations of vision, definition, and construction, and then integrate the iterations together. Other projects may develop and deploy separate iterations, gradually building functionality in use. In all cases, the deliverables of each phase should support the needs of the SFA Business Case for that initiative or project.

Several principles that have guided the development of the SLC are:

- Interaction with the end users and stakeholders is vital to the development of a successful solution;

- There is an inherent need for "standardized" or "core" project deliverables and formats within the SFA organization;
- The process described should be easy to understand and follow, but be flexible enough to allow for growth and change within the organization and its initiatives;
- The SLC should "evergreen", and be continually maintained and kept current; and
- The end goal is meeting the business need, and keeping the documentation to an essential set.

This Guide is organized so that the necessary steps and activities associated with each phase of the life cycle can be easily identified. It is also designed so Project Managers and team members alike can understand the context of each activity within the entire SLC.

2. Vision Phase

Solution Life Cycle

Phases	Vision	Definition	Construction	Deployment	Support
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

A summary of SLC recommendations for use during the Vision Phase is contained within the following matrix.

Phase Area	SLC Recommendations
OBJECTIVE	Understand the specific issue(s) facing SFA and conduct an assessment of the business problem or opportunity, so that a recommended solution can be articulated in a Business Case and the IPT can be formed to begin planning the solution.
ENTRY CRITERIA	• A business need has been identified that requires an assessment and solution recommendation; and A member of the SFA Management team has been identified to guide and oversee the Vision Phase process and development of appropriate outputs.

Phase Area	SLC Recommendations
PROCESS AND OUTPUTS *** Sample is provided in Appendix A**	**Solution Acquisition Planning** • Acquisition Planning Estimation Worksheet • Solution Acquisition Plan • Business Case* • Statement of Objectives (SoO) * • Task Order* • IPT Formation • Communication Plan* • Work Breakdown Structure • Business Performance Model * **Solution Acquisition Project Management** • Status Reports • Risks and Issues Tracked **Requirements Development and Management** • High Level Requirements are developed, approved, and placed into the Business Case **System Security** • Assignment Letters • SLC Security Vision Phase Checklist **Other Processes & Plans Started:** • Quality Assurance Plan • Configuration Management Plan • Transition to Support Plan

Phase Area	SLC Recommendations
ROLES AND RESPONSIBILITIES	**The following roles will participate in this phase, and are defined in the Roles and Responsibilities section:** Chief Information Officer eCommerce Application Development (CIO ECAD) CIO IT Management CIO IT Services CM Lead Decision Support Group (DSG) Executive Sponsor Executive Steering Committee Integrated Product Team (IPT) Investment Review Board (IRB) Information Technical Representative (ITR) Project Manager Quality Assurance (QA) Lead Requirements Development and Management (RDM) Lead Subject Matter Experts System Manager System Security Officer Transition to Support (TTS) Lead

Phase Area	SLC Recommendations
EXIT CRITERIA	**The following are critical exit criteria for this phase:** • First iteration of the Solution Acquisition Plan has been developed and approved. • The Business Case has been developed and approved. • The Task Order has been awarded. • The IPT has been formed. • The Work Breakdown Structure has been approved and baselined. • High Level Requirements are developed and approved. • SLC Security Vision Phase checklist has been completed and approved. • Security Assignment Letters are approved. **The following are recommended exit criteria for this phase:** • A Business Performance Model has been developed and approved. • Status Reports are prepared. • Risks and Issues are documented and tracked. • Requirements Development and Management (RDM) Plan has begun. • Creation of the Quality Assurance (QA) Plan. • Creation of the Configuration Management (CM) Plan. • Creation of the Transition to Support (TTS) Plan.
JOB AIDS **(Provided in Process Guides)**	Acquisition Plan Template Solution Acquisition Project Management Checklist Configuration Management Plan Template Business Case Estimating Tool SLC Security Vision Phase Checklist Requirements Traceability Matrix Template

Vision Phase Objective

The objective of this phase is to understand the specific issue(s) facing SFA and (1) conduct an assessment of the business problem or opportunity; (2) articulate a recommended solution in a Business Case; (3) plan the acquisition of the solution identified in the Business Case and (4) form an IPT.

This is the phase in which solution planning will be performed, and the primary drivers for the remaining phases (i.e., business objectives, performance goals) will be defined.

The Vision Phase is the foundation of the SLC Process Guide, and the Business Case is the blueprint for the solution. The information captured in the Business Case is also used to complete the Solution Acquisition Plan. The Solution Acquisition Plan is a tool used by SFA to plan and manage the acquisition of system development projects. Although the Business Case and the Solution Acquisition Plan are created and approved in this initial phase of the life cycle, it is critical that the development of the solution in subsequent phases tie back to the Business Case and the Solution Acquisition Plan. The requirements must meet the objectives, the design must meet the requirements, the development must meet the design, the testing must verify the design and validate the requirements, and the deployment must satisfy the objectives as outlined in the Business Case and the Solution Acquisition Plan. The following topics will be addressed for the Vision Phase:

- Entry Criteria;
- Process and Outputs;
- Roles and Responsibilities;
- Exit Criteria; and
- Job Aids.

Vision Phase Entry Criteria

In this phase of the SLC Process, the only entry criteria are that (1) an SFA business issue that is in need of an IT solution has been identified, and (2) a member of the SFA management team has been identified to guide and oversee the development of the solution. If these criteria have been met, the Vision Phase processes can be initiated.

Vision Phase Process and Outputs

The following paragraphs discuss the processes and outputs to be completed during the Vision Phase.

Solution Acquisition Planning (SAP)

Solution Acquisition Planning's (SAP) purpose is to ensure that reasonable planning for the solution acquisition is conducted and that all elements of the project are considered. The goal of Solution Acquisition Planning is that planning documents are prepared during the Vision and Definition Phases of the SLC and maintained throughout the SLC. The planning document must address the project's entire acquisition life cycle.

Members of the acquiring organization and the designated project manager will begin to plan the management of the project.   An example of an acquiring organization would be the Business Units, i.e., the Schools Channel and CIO. The project manager should plan for the entire

acquisition life cycle, from the planning phase until the Solution is transition to another organization to support or until the solution is no longer used.

Solution Acquisition Planning occurs throughout the Vision Phase. The first step is for the project manager to estimate the needed resources and time to complete the Vision Phase outputs, for example, the business case. The project manager can use the *Acquisition Planning Estimating Worksheet in the Solution Acquisition Process Guide*.

The contents of the Solution Acquisition Plan should incorporate information from the Business Case and is maintained throughout all phases of the SLC. It includes:

- Estimate the budget for every phase of the SLC and document actual expenditures after each phase is complete.
- Identify SFA resources assigned to manage the acquisition, estimate the days and FTEs for the planning phase (effort) and ensure that SFA resources are trained in managing system acquisitions.
- Document high-level milestones for every phase of the SLC and document actual delivery dates after each phase is complete.
- Explain the Acquisition Strategy completely, including constraints to the acquisition.
- Address all of the aspects of managing an acquisition including project management, solicitation (if applicable), contract tracking and oversight, requirements development and management, supplier evaluation, user acceptance reviews maintenance, transition to support, risk management, quality management, communication, and configuration management.
- Identify the measurements that will be tracked to help manage the acquisition by having important project data available. These measurements will be used to track the success of the project based on what was planned.

Business Case

The first step of creating a business case is to conduct a thorough analysis of the business issue and business needs and recommend a solution to satisfy those needs. This information will be developed by a member of the SFA Management team and documented in the form of a Business Case. The Business Case is used during the IRB investment management process to obtain funding for the project, and will drive subsequent development, implementation and verification of the solution, as well as include estimates for Transition to Support activity and ongoing maintenance. *See the IT Investment Management Operating Procedures.* The business case also supports SFA compliance with the Clinger Cohen Act. *See Appendix A for sample Business Case.*

The Business Case should:

- Identify the root cause of the business need.
- Identify projected costs and benefits.

- Focus on the value of the solution being proposed.
- Clearly identify the scope of the business issue and solution.
- Identify high-level measures of performance.
- Provide ultimate justification for the investment of SFA funds into the recommended solution.

Before the Business Case can be developed, a clear articulation of the business issue(s) must be documented so that a comprehensive recommendation can be determined. This process begins by gathering information from both internal and external sources. The sources should be selected based on their subject matter expertise and knowledge of the business issue that is to be developed in the Business Case. The information gathered for review includes the Modernization Blueprint, existing processes, technologies, resources, timeframes for implementation, SFA organizational structure, and communication methods. During this phase, security should be considered while the system's business case and high level requirements are developed. *See the SFA System Security Process Guide for specific requirements.* Once the research has been completed, the business needs and a detailed solution recommendation should be stated in the Business Case.

The completed Business Case should be submitted to the Decision Support Group (DSG) to enable the Investment Review Board (IRB) investment management process to be initiated. The DSG will review the Business Case and provide feedback for improvements. When satisfied with the Business Case, the DSG will submit it to the IRB for approval. Official agreement to proceed is confirmed through the approval for funding of the Business Case by the IRB, which consists of the Chief Operating Officer (COO), Channel General Manager(s) (GM), the Chief Financial Officer (CFO) and the Chief Information Officer (CIO). The agreement to proceed is provided to SFA Management and may include initial or full funding to develop the solution. In either case, if additional funding or reductions in funding are identified, the Business Case must be updated and resubmitted for approval. *See the IT Investment Management Operating Procedures for details.*

Once approved, the Business Case must be maintained throughout the life cycle phases by the IPT responsible for development of the solution and provided to the IRB. The IRB is responsible for reviewing the investment as it progresses, requesting changes as appropriate, and evaluating the benefits realized after the solution has been delivered to determine if the objectives, costs and benefits outlined in the Business Case were achieved.

Statement of Objectives (SoO)

Once the Business Case has been approved by the IRB and the initial draft of the Solution Acquisition Plan has been developed, the project team should develop the Statement of

Objectives (SoO). The SoO will serve as the basis for the government proposal to be completed during the delivery of the solution, whether by SFA personnel or a team of SFA and contractor personnel. *For a sample SoO, see Appendix A.* The SoO should clearly outline:

- The background of the business issue.
- Objectives of the recommended solution.
- High-level requirements (technical and non–technical) necessary to meet the objectives. These can be copied from the Business Case.
- List of Government provided resources.
- Outputs or deliverables required to meet the objectives and satisfy the requirements.
- Period of performance for the development and implementation of the recommended solution.

Task Order

Once the SoO has been developed, a Task Order may be created and awarded to a contractor team to assist SFA in developing and implementing the solution recommended in the Business Case and planned for in the Solution Acquisition Plan. *For a sample Task Order, see Appendix A.* The Task Order should respond to the SoO in its content, including high level system security requirements. Note that the Task Order is a contractual obligation between SFA and the contractor team and states the responsibilities of both SFA and the contractor during the delivery of the solution.

IPT Formation

Once the task order is approved, and the leads determine an Integrated Product Team (IPT) is needed, an IPT should be formed. The Executive Sponsor appoints a Project Manager responsible for the delivery of the solution. The IPT should contain other members of SFA and the contractor teams necessary for the development and delivery of the solution. The purpose of the IPT is to:

- Ensure that the SLC Process Guide is followed, and all activities are organized around *products* - and focus the team members on delivery of products, not just the tasks they are assigned.
- Engage the right competencies to develop each component (e.g., functional, technical, change management skills, etc.), taking advantage of each team members' skill sets in order to minimize risk.
- Facilitate team communication and understanding of the problem or opportunity and the solution. *See Appendix A for a Sample Communication Plan.*
- Improve cooperation between team members from SFA and the contractor team, while still holding the contractor team responsible for the end products identified in the Task Order

The IPT should be comprised of other team members appropriate to this solution delivery. The composition of the team will vary depending upon the content and type of solution, but may

include members of the Business Unit, CIO eCommerce Application Development (ECAD), CIO Information Technology (IT) Management, CIO IT Services, others from SFA where appropriate and the contractor teams where appropriate.   The team members will hold the key positions for the implementation of the SLC KPA within their areas of responsibility. Some of the positions are: System Manager, System Security Officer, Configuration Manager, Requirements Development Manager, Subject Matter Experts and others. See the specific roles associated with these processes in the additional CMM KPA Guides. The IPT should report periodically to an Executive Steering Committee, consisting of the Executive Sponsor, and an executive from both the CIO and contractor.   The Executive Steering Committee is responsible for reviews and recommendations made by the IPT throughout the delivery of the solution.

The formation of the IPT should be followed by a kick-off meeting with all the participants, in which the objectives, resources, schedule and major outputs are discussed. Other agenda items may include roles and responsibilities, risk management activities, review processes, etc.

Work Breakdown Structure (WBS)

The first output of the IPT should be the Work Breakdown Structure (WBS). This documentation outlines the necessary tasks, level of effort, cost, and schedule for accomplishing the recommended solution. The WBS evolves over time throughout the acquisition life cycle. The purpose of the WBS is to describe how the IPT has tailored the SLC to conduct the project in order to achieve the desired solution. The WBS should:

- Identify the work to be performed, often in a hierarchical view of deliverables and/or tasks required to deliver the solution.
- Include the schedule which illustrates the required timeline of the solution delivery, by identifying start and end dates of each of the major tasks, as well as required completion and delivery dates of major outputs.
- Illustrate the resources required to complete each major task as well as produce each major output.

This WBS should be baselined upon approval, and as it evolves, be maintained by the IPT throughout the life cycle of the solution delivery. As changes occur, the WBS must be reviewed by the SFA CIO Organization, and be approved by the Project Manager and the Executive Sponsor; acknowledged with a sign-off of the document.

Business Performance Model

The Business Performance Model outlines performance targets and indicators for the solution. This is an important output because it provides the capabilities to measure the actual benefits achieved after the solution has been delivered.

The performance targets outlined in the Business Performance Model should relate directly to one or more of the overall SFA performance objectives:

- Reduce unit costs
- Increase customer satisfaction
- Increase employee satisfaction

For a sample Business Performance Model, see Appendix A. The Business Performance Model should contain the definitions of metrics as well as the methods of measurement, presentation, and communication that monitor the performance during implementation. For example, it may outline system availability, or how many transactions are required to be processed within an hour. The Business Performance Model must be approved by the Executive Sponsor, acknowledged with a sign-off of the document.

Solution Acquisition Project Management (SAPM)

The purpose of Solution Acquisition Project Management (SAPM) is to manage the activities of the acquisition to ensure a timely, efficient, and effective solution acquisition.

SAPM activities work in conjunction with the Solution Acquisition Planning (SAP) activities described in the SAP Process Guide that can be found in the Appendix.

SAPM involves planning, organizing, staffing, directing, and controlling project activities, such as determining project tasks, estimating effort and cost, scheduling activities and tasks, training, leading the assigned personnel, and accepting products and services. Project management begins when an IT business need is identified and the project management responsibilities are assigned. Project management terminates when the acquisition is completed.

The Solution Acquisition Project Management Process Guide's primary focus is for SFA project managers who lead solution acquisition projects. The SFA project managers should work in conjunction with the contractor's project manager to develop and implement a solution. However, the two roles ultimately have different responsibilities. The process guide describes the role of the SFA project manager.

For further definition of the Solution Acquisition Project Management process, see the Solution Acquisition Project Management Process Guide.

Requirements Development and Management (RDM)

Requirements Development and Management begins with the identification of high level requirements, translated into business case facts, followed by the development of verifiable requirements that are implemented and deployed. These requirements are defined in the business case and are approved as part of the business case approval process. RDM continues throughout all phases of the Solution Life Cycle.

<u>**System Security**</u>

The Executive Sponsor assigns a System Manager, who in turn, assigns a System Security Officer in writing. *See the SFA System Security Process Guide for qualifications and samples of Assignment Letters.* These positions are Department of Education staff and are critical to the continual inclusion of security into the system. Early identification of these personnel will promote the addition of security into the system's development effort from planning and development through deployment and support. In addition, the certification and accreditation (C&A) requirement for each system stresses the appointment of key personnel to manage the C&A process.

At the end of the Vision Phase, the SLC Security Vision Phase Checklist should be signed off by the System Security Officer (SSO). The checklist represents the completion of all security related activities for the Vision Phase. The activities include:

- Business Case
- Request for Proposal (RFP) Security Requirements
- Task Order Security Components
- List of Business Partners
- Assignment Letters
- Security Artifact File System
- Electronic Security Artifact File System

For more information regarding the SLC Security Vision Phase Checklist, see the System Security Process Guide.

<u>**Quality Assurance (QA)**</u>

Quality Assurance activities begin in the Vision phase with planning and process consulting. QA Lead resources are identified by the Project Manager to draft the project's QA plan. The SFA QA/IV&V Team assigned from CIO-ECAD helps the project ensure that they are building the appropriate system correctly.

For further definition of the Quality Assurance process, see the SFA Quality Assurance Process Guide.

<u>**Configuration Management (CM)**</u>

The Configuration Management Plan provides a general approach for conducting CM activities throughout the acquisition effort. It includes the processes and procedures for assigning CM roles and establishing configuration control, as well as the identification of items to be placed under configuration control. These items will allow tracking of all changes to a system during the specification, designing, coding, testing, deployment and support efforts. The CM Plan also

includes a baselining process to protect the integrity of the system work products. *For further information, see the Configuration Management Process Guide.*

Transition to Support (TTS)

The Transition to Support Plan provides a general approach for conducting TTS activities. It includes: activities of designating an SFA TTS Lead, obtaining estimates and funding for transitioning and support, training the transition coordination team from both the development and the support organizations, transitioning the inventory system products, the conduct of the TTS readiness review, and the transition sign-off. The identification of the support organization is important for providing the knowledge transfer and a seamless takeover of an application in the Support Phase. The timing of the identification of the support organization is not always feasible in the Vision Phase, but the identification must be accomplished before the completion of the Construction Phase.

Vision Phase Roles and Responsibilities

The following matrix provides a guide to the roles and responsibilities of the key personnel that participate in the Vision Phase of the life cycle.

Title	Role	Responsibility
CIO ECAD	Liaison between the CIO and the Business Channels.	Review all documents, including the Business Case, Business Performance Model, Solution Acquisition Plan, SoO and Task Order proposal and make recommendations to the Business Channel for technical acceptance or rejection. Provide SFA QA support.
CIO IT MANAGEMENT	Liaison between the Architecture Review Board (ARB) and the IPT. System Architect, Integration Architect.	Review the solution stated in the Business Case, Solution Acquisition Plan, and the Business Performance Model. Review and recommend any hardware, software, integration, and system architecture needs or procurements to the ARB.
CIO IT SERVICES	Liaison between the Virtual Data Center (VDC) and the IPT.	Review solution approach as defined in Business Case, Solution Acquisition Plan and the Business Performance Model. Provide recommendations for implementing the solution. Provide necessary planning data to the VDC.
CM LEAD	Manage project CM activities.	Draft the Project CM plan.

Title	Role	Responsibility
DSG	Business Case Analysis / Review.	Conduct "across the enterprise" analysis and review of all IT initiatives. Review Business Cases and submit to IRB for approval.
EXECUTIVE SPONSOR	Solution Sponsor.	Sponsor the submitted Business Case and approve the Business Performance Model, Solution Acquisition Plan, and Task Order awards. Assign a System Manager and Project Manager.
EXECUTIVE STEERING COMMITTEE	Project Review and Recommendations.	Responsible for reviews and recommendations made throughout the delivery of the solution.
IPT	Solution Development and Delivery Team.	Definition of project goals and strategy. Development of Solution Acquisition Plan and Business Work Plan. Review Task Order proposal.
IRB	Approve Funding.	Review Business Cases to determine if they meet the SFA's priorities and make the funding determination.
ITR	Liaison between Contractor and Business Channels.	Review solution in Business Case, Solution Acquisition Plan, and Business Performance Model. Advise Executive Sponsor on solution vision issues.
PROJECT MANAGER	Plan and Manage the solution acquisition.	Formulate the IPT. Oversee the acquisition planning. Manage the solution acquisition project.
QA LEAD	Plan and manage QA activities.	Implement QA process. Obtain SFA team support from ECAD. Start QA Plan.
RDM Lead	Develop and manage solution requirements.	Implement the RDM process to develop the high level requirements. High level requirements are reviewed, approved, and baselined. Begin RDM Plan.
SMEs – SFA, EXTERNAL, CONSULTANTS	Review and make recommendations.	Review the solution stated in the Business Case, Solution Acquisition Plan, and the Business Performance Model and make recommendations. Assist in the definition and development of the solution by providing solution-related expertise.

Title	Role	Responsibility
SYSTEM MANAGER	Manage, review, and make recommendations.	Work with the Project Manager to ensure that the solution vision meets the SFA's security requirements, and fulfills readiness for transition to support. Responsible for maintaining the system in the support phase. Assign the SSO. Sign off on the Security Checklist.
SYSTEM SECURITY OFFICER	Review and make recom-mendations.	Ensure that the solution vision meets the SFA's security requirements.
TTS LEAD	Plan and Manage TTS activities.	Draft TTS Plan.

Vision Phase Exit Criteria

The next phase of the life cycle is the Definition Phase, where more details of the project solution will become apparent. These details will include solution requirements and high-level design. Before the Vision Phase is considered complete, however, ensure that the following critical and recommended criteria are met:

Critical:

- First iteration of the System Acquisition Plan has been developed and approved.
- The Business Case has been developed and approved.
- The Task Order has been awarded.
- An IPT has been formed.
- The Work Breakdown Structure has been approved and baselined.
- High Level Requirements are developed and approved.
- SLC Security Vision Phase checklist has been completed and approved.
- Security Assignment Letters are approved.

Recommended:
- A Business Performance Model has been developed and approved.
- Status Reports are being prepared.
- Risks and issues are being tracked.
- RDM Plan has begun.
- Creation of QA Plan.
- Creation of CM Plan.
- Creation of TTS Plan.

Vision Phase Job Aids

The following job aids are available in the appropriate SLC Process Guides:

- Solution Acquisition Plan Template
- Solution Acquisition Project Management Checklist
- Configuration Management Plan Template
- Business Case Estimating Tool
- SLC Security Vision Phase Checklist
- Requirements Traceability Matrix Template

3. Definition Phase

Solution Life Cycle

Phases	Vision	Definition	Construction	Deployment	Support
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

A summary of SLC recommendations for use during the Definition Phase is contained within the following matrix.

Phase Area	SLC Recommendations
OBJECTIVE	Establish and document the requirements and designs necessary to develop, test, and deploy the solution that will provide the benefits as outlined in the Business Case.
ENTRY CRITERIA	• First iteration of the Solution Acquisition Plan has been developed and approved. • The Business Case has been developed and approved. • The Task Order has been awarded. • The IPT has been formed. • The Work Breakdown Structure has been approved and baselined. • High Level Requirements are developed and approved. • SLC Security Vision Phase checklist has been completed and approved. • Security Assignment Letters are approved.

Phase Area	SLC Recommendations
PROCESS AND OUTPUTS *** Sample is provided in Appendix A**	**Solution Acquisition Planning** • Updated Business Case • Approved and Baselined Solution Acquisition Plan • Approved and Baselined Work Breakdown Structure • Updated Business Performance Model * **Solution Acquisition Project Management (ongoing)** **Requirements Development and Management** • Lower Level Requirements Document • RDM Plan • Traceability Matrix **Preliminary Design** • Preliminary Design Document* **Transition to Support** • TTS Plan **System Security** • SLC Security Definition Phase Checklist **Quality Assurance** • Updated Quality Assurance Plan • Memorandum of Records (MOR) **Configuration Management** • Final Configuration Management Plan • Configuration Item Index • Configuration Item Library

Phase Area	SLC Recommendations
ROLES AND RESPONSIBILITIES	**The following roles will participate in this phase, and are defined in the Definition Roles and Responsibilities section:** Chief Information Officer eCommerce Application Development (CIO ECAD) CIO IT Management CIO IT Services Configuration Management (CM) Lead Decision Support Group (DSG) Executive Sponsor Executive Steering Committee Integrated Product Team (IPT) Investment Review Board (IRB) Integrated Technical Representative (ITR) Project Manager Quality Assurance (QA) Manager Requirements Development and Management (RDM) Lead Subject Matter Experts (SMEs) System Manager System Security Officer Transition to Support (TTS) Lead

Phase Area	SLC Recommendations
EXIT CRITERIA	**The following are critical exit criteria for this phase:** • Solution Acquisition Plan has been updated. • Lower Level Requirements Document has been developed, approved, and baselined. • Requirements Traceability Matrix is documented and baselined. • Preliminary Design Document has been developed and approved. • SLC Security Definition Phase checklist has been completed and approved. • Quality Assurance Plan has been approved. • CM Plan has completed, approved, and baselined. • Configuration Item Index has been created. • TTS Plan has been reviewed and approved. • The WBS has been updated. **The following are recommended exit criteria for this phase:** • Business Case, if updated, has been approved. • Business Performance Model, if updated, has been approved. • Task Order, if needed for Construction and Deployment, has been awarded. • The QA MOR has been updated, if necessary, and approved. • Risks and Issues are tracked. • Configuration Item Library System has been created. • RDM Plan has been completed, approved, and baselined.
JOB AIDS	• Solution Acquisition Plan Template • Configuration Management Plan Template • Configuration Item Index Template • Requirements Traceability Matrix • RDM Plan Template • SLC Security Definition Phase Checklist

Definition Phase Objective

The objective of this phase is to establish and document the requirements and preliminary design necessary to develop, test, and deploy the solution that will provide the benefits outlined in the Business Case.

In this phase, further groundwork for the development of the solution (i.e., requirements, design) will be laid. The Business Case and the Solution Acquisition Plan were established in the Vision Phase of the life cycle. In the Definition Phase, the goal is to determine or define what is required

to build the solution based on the Business Case and the Solution Acquisition Plan. This will be accomplished by identifying and documenting the requirements and preliminary design for which the solution will be implemented, tested, and accepted. The RDM Plan and Requirements baseline will become the basis upon which the team defines the products, architecture, and scope of the work to be performed in future phases. As requirements are completed, each requirement is traced back to the Business Performance Model and corresponding performance factors by which the organization will measure the solution's success. The Business Performance Model may need to be updated and resubmitted for approval. Throughout the Definition phase, work is being done to identify further details to update the Business Case, the Solution Acquisition Plan and the WBS.

The following topics and processes will be addressed in this phase of the life cycle:

- Entry Criteria;
- Process and Outputs;
- Roles and Responsibilities;
- Exit Criteria; and
- Job Aids.

Definition Phase Entry Criteria

Before work in the Definition Phase can begin, the exit criteria from the Vision Phase must be completed. To review, these are:

- First iteration of the Solution Acquisition Plan has been developed and approved.
- The Business Case has been developed and approved.
- The Task Order has been awarded.
- The IPT has been formed.
- The Work Breakdown Structure has been approved and baselined.
- High Level Requirements are developed and approved.
- SLC Security Vision Phase checklist has been completed and approved.
- Security Assignment Letters are approved.

Definition Phase Process and Outputs

The following discusses the major processes and outputs to be completed during the Definition Phase. Solution Acquisition Planning is initiated in the Vision Phase. Many of the products developed in the Vision Phase will be updated, re-approved, and baselined. Solution Acquisition Project Management has begun, and status reporting, risks and issues tracking will occur as discussed in the Vision Phase.

Requirements Development and Management

The first step in the Definition Phase is to gather requirements necessary for developing the proposed solution. A complete and thorough requirements gathering and analysis activity should be conducted to produce a Requirements Document. Reference the *RDM Process Guide* to help with this activity. Requirements serve as the basis for:

- Developing a design;
- Making implementation decisions;
- Planning and executing tests; and
- Accepting the delivered system or solution.

There are many different methods for gathering requirements and it is likely that multiple techniques will be used during any project in order to get the complete picture or understanding of the solution. *See the RDM Process Guide.* The following matrix provides a sample of the more commonly used requirements gathering methods, along with a brief description of the activities associated with that method.

Technique	Activity Description	Examples
EXISTING DOCUMENTATION REVIEW	Review documents that may be relevant to the project at hand, using more than one source if possible.	Modernization Blueprint, Architectural Standards, and Business Plans.
WORK PATTERN OBSERVATION	Observe currently established work practices and trends.	Day to day work processes and SMEs.
INTERVIEW SESSIONS	Interview managers and staff to determine their requirements.	Meet with Channel GMs / staff or Business Partners.
JOINT APPLICATION DEVELOPMENT (JAD)	Formal technique that brings functional and technical people together to develop requirements and plan the design. Intense workshop sessions are conducted in which end users and developers collaborate to produce the desired materials.	Special initiative is requested and requirements must be gathered in 3 weeks or less.
ANALYZE HELP DESK TROUBLE	Generate metrics based on Help Desk trouble calls in order to identify trends	Graph indicating type and number of calls per month.

CALLS	and opportunities for improvement.	number of calls per month.
PROTOTYPING	A demonstrable representation that assists in clarifying requirements.	• Screen Mock-up; • User Interface Prototype; • System Concept Prototype.

The Requirements Document should include documentation of the requirement types identified in the following matrix. *A sample Requirements Document is included for reference in Appendix A.*

Category	Description	Sample Requirement Types
BUSINESS	Document the reason for the project initiative. These should tie to the Modernization Blueprint.	• Achieving a competitive advantage; • Meeting regulatory needs; • Reducing cost.
SYSTEM	Describe the features or qualities the system must posses to accommodate the business and functional requirements. Identify the components of the system infrastructure and their associated performance and quality dimensions.	• Architecture; • Communications; • Security; • Performance capacity; • Date storage and retrieval; • Reliability and maintainability.
FUNCTIONAL	Describe day-to-day business activities within which the solution must operate and perform, in order to accomplish its mission, including people and processes.	• Describe system workflow; • Incorporate business rules; • Address quality definitions; • Identify reporting needs.
TECHNOLOGY	Constraints on the IPT development team related to the use of specific technologies. Must adhere to the SFA Technology Architecture Policies and Standards.	• Accommodate the current technology infrastructure; • Implement using a cost-effective technology;

Category	Description	Sample Requirement Types
DEPLOYMENT	Requirements that surface later during the life cycle and impact the delivered solution. Ensure that the deployment requirements trace back to a valid business requirement.	• Maintenance support; • Data conversion; • Deployment; • Training.
DESIGN	Specifies how a particular requirement will be met, rather than just what action a solution or system must perform.	• Design features; • Development environment; • Operating system.

In developing and documenting the requirements, SFA advocates the use of the standard tool to assist in the tracking of requirements and verification that the solution meets the requirements. This will aid in resolving Software Investigation Requests (SIR), as original requirements can be quickly tracked. For more information on standard tools, refer to the *SFA CIO Information Technology Handbook.*

Within the RDM Plan, a requirements traceability matrix is recommended to define the relationships between requirements, documents, design, and implementation of a solution. Requirement traceability facilitates the ability to describe and follow the life of a requirement in both forward and backward directions. It is also recommended the traceability matrix be saved electronically separate from the RDM Plan. *For an example of a Requirement Traceability Matrix, see the RDM Process Guide.*

Figure 3 illustrates how critical it is to be able to trace requirements through the Solution Life Cycle. A development effort begins on the left-hand side of the V-model with analysis and design activities. The Business Case drives the overall requirements, which then drive the design and development activities. Once construction is complete, the product moves through the verification, validation, and testing activities on the right hand side of the V. During the earlier stages of testing, the focus is on individual components. As testing progresses, the focus is on functionality and the achievement of the Business Case. But all throughout, each task (indicated by a 'T' on Figure 3) or task package (indicated by a 'TP') ensures that the overall Business Case objectives and subsequent requirements are achieved. A requirements traceability matrix can effectively be used to map the requirements to Business Case objectives (on the front end) and to the preliminary design (on the back end).
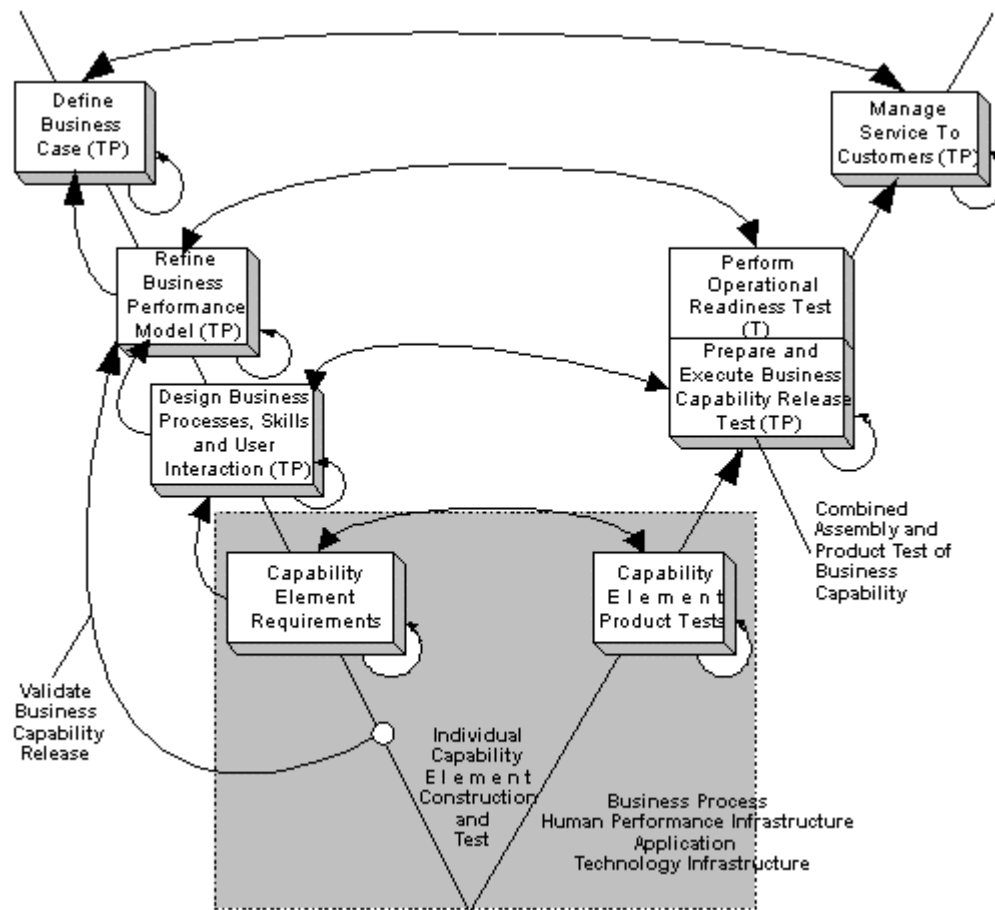
Figure 3 Requirements Traceability Diagram

One technique to facilitate review of requirements is a System Requirements Review (SRR). This is an interim review and/or committal point that provides an opportunity for the Executive Sponsor and IPT to agree upon and approve the solution requirements. During the review, all requirements documented in the Requirements Document are reviewed by both the Executive Sponsor and IPT, to ensure that everyone agrees on what the solution must accomplish. Sign-off must be obtained from the Executive Sponsor before moving into design mode, so the requirements can be baselined. After that, any new or modified requirements will require modification of the Requirements Document and approval by the Executive Sponsor prior to solution design modification.

Preliminary Design

Once the requirements have been agreed to by the Executive Sponsor and the IPT, the next step is to create the Preliminary Design, which will provide an abstract model of the solution. The

Preliminary Design of the solution is often depicted visually through the use of graphic models, process flows, and block diagrams.

A sample Preliminary Design Document is included for reference in Appendix A. The project identifies specific work products to be developed in the WBS. The Preliminary Design Document typically includes the following documents.

- **System Architecture Diagrams** - modular and layered graphical representation of the solution, accompanied by a written description that provides a more detailed explanation of the components, including descriptions of their respective functions and how they interrelate;
- **User Interface and Workflow -** screen diagrams and menus as well as storyboards that describe the look and feel of the recommended solution. The storyboards should indicate how information will flow through the system and how users will access that information;
- **Logical Data Models -** diagram of the data that is to be processed and stored by the system. This diagram and associated data dictionary describe the entities (data components), their attributes or fields, indexes, and foreign keys;
- **Report Content Descriptions -** includes a discussion of what tools, if any will be used to generate ad hoc and "canned" reports. Also describes:
  - Number and types of reports;
  - Frequency of report generation;
  - Sources for the information to be reported;
- **External System Interfaces -** describes how the recommended solution would interface with external systems. This should include for each external system:
  - *Frequency* that data will be exchanged;
  - *Manner* of the exchange (real-time, batch on-demand, or scheduled);
  - *Description* of the data to be exchanged; and
  - *Assignment* of the system of record (which systems will have the authority to create, update, or delete data elements);
- **Data Conversion and Migration Strategies -** describes how legacy data will be converted and migrated into the new system. Any data conversion and migration strategy must comply with the standards set forth in the Logical Data Model. The following information should be included for each legacy data set:
  - Location;
  - Data elements;
  - Volume of data to be converted;
  - Method to be utilized for the conversion (manual or automated data input, data transformation routine, or data load routine); and
  - Timing of the migration;
- **Interface Control -** defines one or more interfaces between two systems;
- **System Test Plans -** outlines the various kinds of testing that will be performed during the Construction Phase. It includes:
  - Overall testing approach;
  - Strategy for planning and executing each type of test;

- Justification for not including a particular type of test; and
- Test automation strategy, if applicable.

Refer to the System Integration and Testing Process Handbook for guidance for creating the System Test Plan.

- **System Test Description -** detailed plans needed for testing the solution. A detailed plan is required for each type of test outlined in the testing strategy. Test plans will not be fully developed until the detailed design is completed during the Construction Phase, but for now should include:
  - Test scenario description;
  - Inputs and outputs;
  - Expected results;
  - Frequency of tests; and
  - Test automation plan, if applicable.

  Refer to the System Integration and Testing Process Handbook for guidance for creating the System Test Description.

One technique to facilitate review of a preliminary design is to hold a Preliminary Design Review (PDR). This formal review should cover the entire Preliminary Design Document from beginning to end. This comprehensive walkthrough gives the Executive Sponsor the opportunity to develop a common understanding of the requirements and to resolve any outstanding issues. The PDR gives the IPT team one last forum to ensure understanding of requirements, acceptance criteria, and assumptions. The PDR provides a high-level picture of the solution and allows IPT members and the Executive Sponsor to make major implementation decisions simply and cost-effectively. It also gives the team an opportunity to make an early reality check and to verify that the solution is consistent with the requirements.

The PDR is also the appropriate time for the discussion on how the solution will be developed and deployed (i.e., custom development, use of COTS software or ASP vendors, etc.). The completion of the Definition Phase is a decision point for the IPT and the Executive Sponsor with regards to the most effective means of providing the solution. Approval of the Preliminary Design Document, as well as this development and implementation decision, must be obtained from the Executive Sponsor, acknowledged by sign-off, before exiting this phase.

If additional funding or contractor support is needed to construct and deploy the solution, then the Business Case will need to be updated by the IPT and approved by the IRB and a new Statement of Objectives may need to be created in order to award a new Task Order for the Construction and Deployment Phases.

Transition to Support (TTS)

The Transition to Support plan is approved by the IPT project manager in conjunction with the sign-off of the project work plan by the Executive Sponsor. The TTS plan must be maintained

throughout the Support Phase of the project life cycle. The TTS lead is responsible for maintaining the TTS plan.

System Security

As the system progresses through the definition phase, several security actions should occur. The system should be defined as a new system or major modification to an existing system. The system's sensitivity should be classified and the system's criticality should be defined. To define sensitivity, the system owner (and its data) should review the importance of confidentiality, integrity, and availability. These factors dictate the security controls necessary to protect the assets of the system. Similarly, a security review should occur which will identify threats to the system as well as intrinsic vulnerabilities. Finally, the system's controls should be reviewed for federal and departmental policy compliance. At a minimum, the system should be reviewed for compliance with OMB Memorandum A-130 Appendix III, the Privacy Act, GISRA (NIST Self-Assessment), Department of Education Policy, and SFA policy. A security guidance compliance matrix should be constructed to document the findings of the review.

Additionally, at the end of the Definition Phase, the SLC Security Definition Phase Checklist should be signed off by the System Security Officer (SSO). The checklist represents the completion of all security related activities for the Definition Phase. The activities include:

- System Roles and Responsibilities
- System Identification and Analysis
- Threat and Vulnerability Assessment
- Security Guidance Compliance Matrix
- Interconnected System(s)' Security Documentation
- Memorandum of Understanding (MOU)/Service Level Agreement (SLA) Draft
- C&A Project Plan
- System Rules of Behavior
- Constructed Clearance Requirement Matrix
- Approved Contractor Access Request Form

For more information regarding the SLC Security Definition Phase Checklist, see the System Security Process Guide.

Quality Assurance (QA)

Quality Assurance continues from the Vision Phase. The QA Plan is completed and approved and QA reviews are conducted to verify adherance to plan standards and processes. The organization SFA QA Team representative(s) evaluates activities and work products for compliance with applicable procedures, standards, and policies, as well as, completeness, consistency, appropriateness and applicability.

In addition, the SFA QA Team representative documents all noncompliance issues in a Memorandum of Record (MOR) document. There are 3 categories of findings:

- Major noncompliance – schedule risk, feature risk or incorrect metrics;
- Minor noncompliance – all others;
- Observation – potential improvement opportunity.

<u>**Configuration Management (CM)**</u>

The Configuration Management Plan is updated and finalized before the Construction Phase. In addition, the Configuration Item Index and the Configuration Library System are created.

Definition Phase Roles and Responsibilities

The following matrix is provided as a guide to the roles and responsibilities of the key personnel that are in the Definition Phase of the life cycle.

Title	Role	Responsibility
CIO ECAD	Liaison between the CIO and the Business Channels.	Participate in the development of and review the Requirements Document and Preliminary Design to ensure they meet the objectives defined in the Business Case and Business Performance Model. Conduct reviews to ensure compliance to the SLC Process Guide and SFA QA standards.
CIO IT MANAGEMENT	Liaison between the AWG and the IPT.	Review the content within the Requirements and Preliminary Design Documents to ensure they meet the Technical Architecture standards. Review any hardware, software, integration, and system architecture needs or procurement in support of the Architecture Working Group (AWG).
CIO IT SERVICES	Liaison between the VDC and the IPT.	Review the Requirements and Preliminary Design documents and work with IPT to identify needed VDC services. Notify the VDC of any planning changes identified during this phase.
CM LEAD	Manage project CM activities.	Update and finalize the Project CM plan. Create the Configuration Item Index and the Configuration Library System.
DSG	Business Case Analysis / Review.	Conduct "across the enterprise" analysis and review of all IT initiatives. Review Business Cases and submit to IRB for approval.
EXECUTIVE SPONSOR	Solution Sponsor.	Review and approve Requirements Document and Preliminary Design Document. Also, review and approve any changes made to the Business Performance Model, Solution Acquisition Plan, Business Case and Task Order award.

Title	Role	Responsibility
EXECUTIVE STEERING COMMITTEE	Project Review and Recommendations.	Responsible for reviews and recommendations made throughout the delivery of the solution.
IPT	Solution Development and Delivery Team.	Requirements Documentation and Preliminary Design.
IRB	Approve Funding.	Review Business Cases to determine if they meet the SFA's priorities and make the funding determination.
ITR	Liaison between contractors and Business Channels.	Review the Requirements and Preliminary Design Documents to ensure they meet the objectives as stated in the Business Case and the Business Performance Model.
PROJECT MANAGER	Plan and manage the acquisition project	Manage the solution acquisition project. Oversee the development, review, and approval of all critical outputs, including requirements and preliminary design.
QA LEAD	Plan and manage QA activities.	Ensure that the project is performing all necessary QA activities as defined in the QA Plan. Implement QA process obtaining SFA team support from ECAD. Finalize QA Plan.
RDM LEAD	Develop and manage solution requirements.	Implement the RDM process to decompose high level requirements to low level requirements. Complete and baseline RDM Plan. Develop and maintain Requirements Traceability Matrix.
SMEs – SFA, EXTERNAL, CONSULTANTS	Provide input to the Requirements and Preliminary Design.	Assist in the definition and development of the Requirements and Preliminary Design Documents by providing solution-related expertise.
SYSTEM MANAGER	Manage, review, and make recommendations.	Work with the Project Manager and System Security Officer to ensure security meets the SFA's security requirements. Assign SSO. Sign off on the SLC Definition Phase Checklist. Approve the TTS Plan.
SYSTEM SECURITY OFFICER	Review and make security recommendations.	Work with the Project Manager, System Manager, and others to ensure that the solution requirements and Preliminary Design meet the SFA's security requirements. Sign off on the SLC Definition Phase Checklist.

Title	Role	Responsibility
TTS LEAD	Plan and manage TTS activities.	Develop the TTS Plan. Conduct review and obtain approval of the TTS Plan.

Definition Phase Exit Criteria

The next phase, Construction, is where the solution is developed and tested. Prior to that phase beginning, the following exit criteria for this phase must be met:

Critical:

- Solution Acquisition Plan has been updated.
- Requirements Document has been developed, approved, and baselined.
- Requirements Traceability Matrix has been baselined.
- Preliminary Design Document has been developed and approved.
- SLC Security Definition Phase checklist has been completed and approved.
- Quality Assurance Plan has been approved.
- CM Plan has been completed, approved, and baselined.
- Configuration Item Index has been created.
- TTS Plan has been reviewed and approved.
- The Work Breakdown Structure has been updated.

Recommended:

- Business Case, if updated, has been approved.
- Business Performance Model, if updated, has been approved.
- Task Order, if needed for Construction and Deployment, has been awarded.
- The QA MOR has been updated, if necessary, and approved.
- Risks and Issues are tracked.
- Configuration Library System has been created.
- Requirements Development and Management Plan has been completed, approved, and baselined.

Definition Phase Job Aids

The following job aids are available in the appropriate SLC Process Guides:

- Solution Acquisition Plan Template
- Configuration Management Plan Template
- Configuration Item Index Template
- Requirements Traceability Matrix

- RDM Plan Template
- SLC Security Definition Phase Checklist

4. Construction Phase

Solution Life Cycle

Phases	Vision	Definition	Construction	Deployment	Support
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

A summary of SLC recommendations to use during the Construction Phase is contained within the following matrix.

Phase Area	SLC Recommendations
OBJECTIVE	The objective of this phase is to develop and test an appropriate solution that meets the requirements defined in the Definition Phase, as well as the approved Business Case.
ENTRY CRITERIA	• Solution Acquisition Plan has been updated. • Requirements Document has been developed, approved, and baselined. • Requirements Traceability Matrix is baselined. • Preliminary Design Document has been developed and approved. • SLC Security Definition Phase checklist has been completed and approved. • Quality Assurance Plan has been approved. • CM Plan has completed, approved, and baselined. • Configuration Item Index has been created. • TTS Plan has been reviewed and approved. • The Work Breakdown Structure has been updated.

PROCESS AND OUTPUTS *** Sample is provided in Appendix A**	**<u>Solution Acquisition Planning (as needed)</u>** **<u>Solution Acquisition Project Management (ongoing)</u>** **<u>Requirements Development and Management</u>** • Updated Requirements Traceability Matrix **<u>Detail Design</u>** • Detailed Design Document **<u>System Security</u>** • SLC Security Construction Phase Checklist • System Security Plan • Construction Phase Risk Assessment **<u>Build Solution</u>** • Solution **<u>Solution Testing</u>** • System Test Plans • System Test Results **<u>Quality Assurance</u>** • Memorandum of Records (MOR) • Production Readiness Review (PRR) **<u>Configuration Management</u>** • Updated Configuration Item Index • CM Audit Findings **<u>Production Readiness Review (PRR)</u>** • PRR Material **<u>Transition to Support Readiness Review</u>** • TTS Readiness Readiness Review material

ROLES AND RESPONSIBILITIES	**The following roles will participate in this phase, and are defined in the Construction Roles and Responsibilities section:** Chief Information Officer eCommerce Application Development (CIO ECAD) CIO IT Management CIO IT Services Configuration Management (CM) Lead Executive Sponsor Executive Steering Committee Integrated Product Team (IPT) Integrated Technical Representative Project Manager Quality Assurance (QA) Lead Requirements Development and Management (RDM) Lead Subject Matter Experts (SMEs) System Manager System Security Officer Transition to Support (TTS) Lead
EXIT CRITERIA	**The following are critical exit criteria for this phase:** • The Requirements Traceability Matrix has been updated. • A Detailed Design Document has been developed and approved. • System Security Construction Phase checklist has been completed and approved. • Test Plans have been developed. • A developed and tested solution, including source, object, and execution code has been accepted. • PRR has been conducted and signed off. • Configuration Item Index has been updated. • Support Organization has been identified. • QA Reviews have been conducted as documented in the QA plan. **The following are recommended exit criteria for this phase:** • Construction Phase Risk Assessment has been completed. • CM Audit Findings have been addressed. • Develop the MOR. • TTS Readiness Review Material is developed.

JOB AIDS	PRR Checklist Configuration Management Audit Checklist Template SLC Security Construction Phase checklist TTS Checklist

Construction Phase Objective

The objective of this phase is to develop and test an appropriate solution that meets the requirements and acceptance criteria defined in the Definition Phase, as well as the approved Business Case.

The activities undertaken during the Construction Phase vary from project to project more so than in any other phase. The approach, tools, techniques, and deliverables will be determined in earlier strategy and tactical approach discussions and will be tailored to meet each specific solution. For example, the decision to develop and implement a custom solution, versus a COTS-based solution, or one involving an ASP, should be made before this phase begins. The processes and outputs documented in the Construction section and Deployment section of this Guide apply to IPTs that have made the decision to implement the solution via custom development or using COTS software. Implementing with an ASP will enable the IPT to skip the processes and outputs associated with the Construction and Deployment Phases of the SLC.

The Construction Phase is where the high-level design is further refined into a detailed design. This phase is where the team builds a solution that meets the approved requirements. The Construction Phase consists of detailed design, construction and testing efforts, with the intent that the output of these efforts will meet the objectives as outlined in the Business Case. It is in this phase that the technical solution derived in the Definition Phase is implemented.

The following topics and processes will be addressed in this phase of the life cycle:

- Entry Criteria;
- Process and Outputs;
- Roles and Responsibilities;
- Exit Criteria; and
- Job Aids.

Construction Phase Entry Criteria

Before work in the Construction Phase can begin, the exit criteria from the Definition Phase must be completed. To review, these are:

- Solution Acquisition Plan has been updated.
- Requirements Document has been developed, approved, and baselined.

- Requirements Traceability Matrix is baselined.
- Preliminary Design Document has been developed and approved.
- SLC Security Definition Phase checklist has been completed and approved.
- Quality Assurance Plan has been approved.
- CM Plan has completed, approved, and baselined.
- Configuration Item Index has been created
- TTS Plan has been reviewed and approved.

Construction Phase Process and Outputs

The following paragraphs discuss the major processes to be completed during the Construction Phase, as well as the outputs of this phase.

Solution Acquisition Planning is conducted as needed as discussed in the Vision Phase and Definition Phases. Solution Acquisition Project Management is ongoing, and status reporting, risks and issues tracking continue as discussed in the Vision and Definition Phases. Additionally, the Requirements Traceability Matrix is updated. The Detail Test Plan is created.

Detailed Design

The Detailed Design Document should provide enough information in order for the solution to be thoroughly developed. The Architecture Working Group (AWG) will be involved in the review process; therefore, the designs must also be able to convey conformity to the SFA Technical Architecture standards. *For sample Detailed Design Document, see Appendix A.* The Detailed Design Document should build upon the Preliminary Design Document. The IPT WBS will be tailored to identify the specific documents and may include the following:

- **Program/Screen/Reports Design** - describes the exact detailed configuration of the computer program. It consists of descriptions of the processing logic, data structures, data definitions, screen or report layouts (where applicable) and is sufficiently detailed so that it can be implemented into a solution;
- **Interface Design** - provides the specific details of the user interface, including dialogs or conversations, window screens or pages, forms, reports, and possibly user interface hardware (monitors, input devices);
- **Development Architecture Design** – builds on the system architecture diagrams from the Preliminary Design Document, providing the detail needed to construct the solution development architecture, such as hardware, software, access methods, and protocols used. The design specification further outlines actual sites, minimum configuration requirements, and site requirements (size, power, temperature, etc.);
- **Execution Architecture Design** – builds on the system architecture diagrams from the Preliminary Design Document, providing the detail needed to construct the solution execution (run-time) architecture, such as hardware, software, access methods, and protocols used. The design specification further outlines actual sites, minimum configuration requirements, and site requirements (size, power, temperature, etc.);

- **Operations Architecture Design** - builds on the system architecture diagrams from the Preliminary Design Document, providing the detail needed to support operation of the solution in an efficient manner;

- **Physical Infrastructure Design** - builds on the system architecture diagrams from the Preliminary Design Document, providing detailed diagrams, interface standards, protocols, and so forth to support the physical network and computing components. The detailed design should provide adequate information on how to configure and install the physical network and computing components;

- **Human Performance Design** – design the programs needed to evaluate, compensate, develop, and recruit personnel for the solution;

- **Physical Data Model Design** - provides the information and code needed to create or generate the solution database. It builds on the Logical Data Models defined in the Preliminary Design Document; and

- **Security Design** – provides detailed information on security requirements relating to facility, physical access, system access, administrative privileges, sensitive and mission-critical operations, site-specific practices, and other matters.

One technique to facilitate effective review of the Detailed Design Document is through a Critical Design Review (CDR). This formal review should cover the entire Detailed Design Document from beginning to end. This comprehensive walkthrough gives the IPT and the Executive Sponsor the opportunity to develop a common understanding of the detailed solution design and to resolve any outstanding issues. Sign-off must be obtained from the Executive Sponsor before exiting this phase.

System Security

The Construction Phase contains numerous security activities. A large portion of these activities is dedicated to documentation. To complete the System Security Plan, see the System Security Process Guide.

Additionally, at the end of the Construction Phase, the SLC Construction Phase Checklist should be signed off by the SSO. The checklist represents the completion of all security related activities for the Construction Phase. The activities include:

- Draft System Security Plan
- Draft Continuity of Operation Plan
- Draft Disaster Recovery Plan
- Draft System Security Authorization Agreement
- Threat Analysis
- Impact Analysis
- Risk Assessment Corrective Action Plan
- Final MEMORANDUM OF UNDERSTANDING (MOU)/SERVICE LEVEL AGREEMENT (SLA)
- Completed User Background Investigation Clearance Form

- Approved User Access Request Form
- System Access Letter to Contractor Employees

For more information regarding the SLC Security Construction Phase Checklist, see the System Security Process Guide.

Build Solution

The solution is constructed by transforming the design to meet the requirements outlined in the Business Case. During this transformation from design, the application will be developed, tested and accepted by SFA prior to implementation, or deployment into production. For applications requiring custom development, this will entail writing code, while for applications utilizing a COTS product; modifications to the COTS product may be required. Appendix A contains information relating to Internet development standards, but for more discussion on SFA software development practices and standards, refer to the SFA CIO *Information Technology Handbook*.

Solution Testing

Once the solution has been developed, it is the responsibility of the IPT to test the application to ensure that the solution satisfies the defined functional, technical, and quality requirements. Refer to the *SFA System Integration and Testing Process Handbook* for the testing standards, procedures, templates and management guidelines used during testing. The first step in the testing process is the development of the test plans that were identified in the Testing Strategy of the Preliminary Design Document. Test plans should document all activities required to conduct thorough and accurate tests of system parameters, customizations, interface modules, and business processes.

The IPT is responsible for planning, preparing/developing, and executing each test plan. At this step, the test conditions, cycles, and scenarios should be identified, and individual responsibilities specified relating to the development and execution of the tests. Planning the tests also includes locating and inspecting all the documents, information, and infrastructure (e.g. hardware and software testing tools) necessary to design, develop, and execute the test plan. The test planning for each level is described as follows:

- *Unit Test Plan* – This document defines common testing conditions, outlines the approach for executing the unit test, and describes the process and tasks to the developer;
- *Integration Test Plan* – This document defines the approach for executing the integration test, details the integration test objective, assumptions, and potential risk. The plan should also detail the necessary resources and test requirements;
- *Systems Test Plan* – This document defines the approach for executing the systems test, and details the objective, assumptions, and potential risk. Also included in the test plan are the test requirements and the test resources;
- *Performance Test Plan* – This document defines the approach for executing the performance test, and details the objective, assumptions, and potential risk. Also included in the test plan

are the test requirements and the test resources. The test plan will detail how to simulate large transaction volume and critical response time areas to be tested; and

- *User Acceptance Test Plan* – This document defines the approach for executing user acceptance test, and details the objective, assumptions, and potential risk. Also included in the test plan are the test requirements and the test resources. *Appendix A contains a sample User Acceptance Test Plan.*

During test planning, it is important to identify all possible scenarios that could affect the way the application will behave. These scenarios can be as detailed as applicable, depending on the time and abilities of the application/system being tested. Test scripts provide a description of inputs, execution instructions, and expected results created to determine if a specific application software feature functions correctly or if a specific requirement was satisfied. Unit, system, and integration test scripts rely on the design of the code in addition to the requirements and are initially developed during detailed design as part of the test strategy. Test scripts are continuously updated, as design and code are refined during the Construction Phase. The test script process for each level of testing is described below:

- *Unit Test Scripts* – Unit test scripts are based on knowledge of how the logical unit is designed to work and can be written once the detailed design specifications are completed. Each script includes tests for field ranges, values and lengths, each function, data validation, data dependencies, and special processing contained in the module. The unit test scripts should be updated as changes occur to the requirements and/or the detailed design specifications either before coding starts or while it is in process. The developer responsible for the module will run the unit test for that module. At the end of the unit test, all errors related to the independent operation of the program should be found;

- *Integration Test Scripts* – While the unit test scripts focus on the smallest logical unit or module of code, the integration test scripts focus on how multiple components work together and communicate. The integration test scripts describe test cases for the interfaces and interactions between system components as they are put together to form progressively larger subsystems. Integration test scripts also test the screens together as a cohesive information function, and then are built upon to test how the information function integrates with other functions in the system. By the end of integration test, all functions will be integrated into the system and all internal interfaces will be tested;

- *System Test Scripts* – The system test scripts expand on the high-level test scenarios and scripts developed during high-level design. The testers can reuse relevant test scenarios and conditions from the unit and integration test scripts;

- *Performance Test Scripts* – The performance test scripts expand on the high-level test scenarios and scripts developed during high-level design. These scripts detail the steps necessary to fully ensure that the deployed solution will be able to handle the expected workload and adequately address the business objectives stated in the Business Case and Business Performance Targets stated in the Business Performance Model; and

- *User Acceptance Test Scripts* – User acceptance test scripts expand on the high-level test scenarios and scripts developed during high-level design. User acceptance test scripts test the requirements from a user perspective. They include enough test conditions to determine if the application meets the user acceptance criteria.

In developing and documenting the testing approach, SFA advocates the use of the standard tool to assist in the tracking of requirements and verification that the solution meets the requirements. This will aid in resolving Software Investigation Requests (SIR), as original requirements can be quickly tracked. For more information on standard tools, refer to the Information Technology Handbook.

Once these tests have been successfully executed by the IPT, the Test Results should be documented that clearly indicate the testing procedures, data used during the testing processes and results demonstrating that the application meets the business objectives as stated in the Business Case and meets the performance targets as stated in the Business Performance Model.

Quality Assurance (QA)

Quality Assurance continues from the Vision Phase. The QA Plan is completed and approved and QA reviews are conducted to verify adherance to plan standards and processes. The organization SFA QA Team representative(s) evaluates activities and work products for compliance with applicable procedures, standards, and policies, as well as, completeness, consistency, appropriateness and applicability.

Configuration Management (CM)

The CM Lead works with CIO ECAD to ensure a CM audit is conducted and findings are addressed. CM artifacts should match the CM Item Index and be placed into the CM Library.

Production Readiness Review (PRR)

The PRR is a common process that defines the activities and the roles of all IT groups supporting the decision to implement a production application. *For checklist to aid in the preparation for the PRR, See Appendix A.*

The objectives of the PRR are as follows:

- Review performance compared to anticipated value and success measures;
- Review converted data; and
- Assess the readiness of technology infrastructure.

Once the PRR has been completed, the solution is ready to be deployed and turned over to the Support Organization. For more information on the activities associated with the PRR, refer to the *PRR Procedures Guide* in the *Information Technology Handbook*.

Transition to Support (TTS)

The TTS Readiness Material is developed. The purpose of TTS is to provide detailed knowledge of the solution and its artifacts in order to prepare a TTS Readiness Review. The TTS Readiness

Review is conducted to provide a more comprehensive review in terms of readiness of the support organization. The Readiness Review enables the SFA TTS Lead to further evaluate the capacity and capability of the support organization and readiness of the solution documentation. *For more information, see the Transition To Support Process Guide.*

Construction Phase Roles and Responsibilities

The following matrix is provided as a guide to the roles and responsibilities of the key personnel that are in the Construction Phase of the life cycle.

Title	Role	Responsibility
CIO ECAD	Liaison between the SFA QA Team and the Project Team.	Conduct reviews to ensure compliance to the SLC Process Guide and SFA QA standards. Act as liaison between the SFA QA Team and the Project Team. Support Project to meet quality standards and guidelines. Recommend CIO sign-off for the PRR.
CIO IT MANAGEMENT	Liaison between the Architecture Working Group (AWG) and the IPT.	Review the content within the Detail Design Documents to ensure they meet the Technical Architecture standards. Review and any hardware, software, integration, and system architecture needs or procurements in support of the AWG.
CIO IT SERVICES	Liaison between the VDC and the IPT.	Review the Requirements and Preliminary Design documents and work with IPT to identify needed VDC services. Notify the VDC of any planning changes identified during this phase.
CM LEAD	Manage project CM activities.	Conduct the CM Audit and report the findings. Update the Configuration Item Index.
EXECUTIVE SPONSOR	Solution Sponsor.	Review and approve Detail Design Document. Also, review and approve any changes made to the Business Performance Model, Solution Acquisition Plan, Business Case and Task Order. Sign off on the PRR.

Title	Role	Responsibility
EXECUTIVE STEERING COMMITTEE	Project Review and Recommendations.	Responsible for reviews and recommendations made throughout the delivery of the solution.
IPT	Solution Development and Delivery Team.	Design, build, and test solution. Support the QA, CM, Security and TTS activities. Prepare for PRR.
ITR	Liaison between contractors and Business Channels.	Review the Detail Design Documents to ensure they meet the objectives as stated in the Business Case and the Business Performance Model, and make appropriate recommendations.
PROJECT MANAGER	Plan and manage the acquisition project	Implement and manage IPT and project in accordance with the Solution Acquisition Plan. Schedule and conduct PRR.
QA Lead	Plan and manage QA reviews.	Ensure that the project is performing all necessary QA activities as defined in the QA Plan. Act as liaison between the SFA QA Team and the project team, and make QA recommendations for the PRR.
RDM LEAD	Manage and control changes to solution requirements.	Monitor, trace, and report on requirement Change Requests. Coordinate communications between project team and User Representatives regarding system requirements. Manage the RDM processes. Update the Traceability Matrix.
SMEs – SFA, EXTERNAL, CONSULTANTS	Provide input to the Detail Design.	Assist in the definition and development of the Requirements and Detail Design Documents by providing solution-related expertise.
SYSTEM MANAGER	Manage, review, and make recommendations.	Work with the Project Manager and System Security Officer to ensure security meets the SFA's security requirements. Sign off on the SLC Security Construction Phase Checklist.

Title	Role	Responsibility
SYSTEM SECURITY OFFICER	Review and make security recommendations.	Work with the Project Manager, System Manager, and others to ensure that the solution requirements Detail Design meets the SFA's security requirements. Sign off on the SLC Security Construction Phase Checklist.
TTS LEAD	Manage the transition preparation process.	Ensure the support organization is identified; manage the preparation of TTS Readiness Review.

Construction Phase Exit Criteria

In the Construction Phase, the development of the detailed design and how this detailed design built upon on the Preliminary Design and traced back to the Requirements Document and the Business Case was discussed. The Requirements traceability matrix was used as the trace back process. The construction and testing of the solution was also discussed. The PRR process was mentioned as a last step in the Construction Phase to be completed prior to the implementation of the solution.

Prior to the completion of the Construction Phase, the following exit criteria must be met:

Critical:

- The Requirements Traceability Matrix is updated.
- A Detailed Design Document has been developed and approved.
- System Security Construction Phase checklist has been completed and approved.
- Test Plans have been developed.
- A developed and tested solution, including source, object, and execution code has been accepted.
- PRR has been conducted and signed off.
- Configuration Item Index has been updated.
- Support Organization has been identified.
- QA Reviews have been conducted as documented in the QA plan.

Recommended:

- Construction Phase Risk Assessment has been completed.
- Test Results have been developed.
- CM Audit Findings have been addressed.
- Develop the MOR.
- TTS Readiness Review Material is developed.

Construction Phase Job Aids

The following job aids are available in the Process Guides:

- PRR Checklist
- Configuration Management Audit Checklist Template
- SLC Security Construction Phase Checklist
- TTS Checklist

5. Deployment Phase

Solution Life Cycle

Phases	Vision	Definition	Construction	Deployment	Support

Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	Production Services
	Solution Recommendation	Preliminary Design	Accepted Solution		

A summary of SLC recommendations to use during the Deployment Phase is contained within the following matrix.

Phase	SLC Recommendations
OBJECTIVE	Deploy the developed solution into production for utilization by the user community.
ENTRY CRITERIA	• The Requirements Traceability Matrix is updated. • A Detailed Design Document has been developed and approved. • System Security Construction Phase checklist has been completed and approved. • Test Plans have been developed. • A developed and tested solution, including source, object, and execution code has been accepted. • PRR has been conducted and signed off. • Configuration Item Index has been updated. • Support Organization has been identified.
PROCESS AND OUTPUTS *** Sample is provided in Appendix A**	**Solution Acquisition Planning (as needed)** • Updated Work Breakdown Structure **Solution Acquisition Project Management (ongoing)** **Transition to Support** • Deployed Solution • Project inventory list • Support readiness orientation • Transition sign-off • Conduct User Training • Service Level Agreements* **System Security** • Final System Security Plan • SLC Security Deployment Phase Checklist • Risk Assessment Corrected Action Plan completed **Quality Assurance** • QA reviews **Configuration Management** • Baselined and migrated Configuration Item to VDC

ROLES AND RESPONSIBILITIES	**The following roles will participate in this phase, and are defined in the Deployment Roles and Responsibilities section:** CIO IT Services Configuration Management (CM) Lead Executive Sponsor Executive Steering Committee Integrated Product Team (IPT) Project Manager Quality Assurance (QA) Lead System Security Officer Transition to Support (TTS) Lead
EXIT CRITERIA	**The following are critical exit criteria for this phase:** • Solution has been successfully deployed. • Project inventory list is complete. • TTS readiness review is completed. • Transition sign-off is completed. • SLC Security Deployment Phase checklist is completed and approved. • System Security Plan is complete. • Configuration Item Index baselined and migrated. **The following are recommended exit criteria for this phase:** • Applicable training has been conducted. • Arrangements have been made with the organization(s) responsible for operating and maintaining the solution (SLAs have been established). • QA Reviews have been conducted as documented in the QA plan.
JOB AIDS	• SLC Security Deployment Phase Checklist

Deployment Phase Objective

The objective of the Deployment Phase is to place the system in production and enable the organizational adoption of a solution. The Deployment Phase transitions a solution from development and acceptance to production. At the conclusion of the Deployment Phase, the new system is considered in "Production" and the Support Phase commences.

As with the Construction Phase, the decision to develop and implement a custom solution, versus a COTS-based solution, or one involving an ASP, with impact the activities in this phase. The processes and outputs documented in the Construction section and Deployment section of this Guide apply to IPTs that have made the decision to implement the solution via custom development or using COTS software. Implementing with an ASP will enable the IPT to skip some of the processes and outputs associated with the Construction and Deployment Phases of the SLC.

The following topics and processes will be addressed in this phase of the life cycle:

- Entry Criteria;
- Process and Outputs;
- Roles and Responsibilities;
- Exit Criteria; and
- Job Aids.

Deployment Phase Entry Criteria

Before work in the Deployment Phase can begin, the exit criteria from the Construction Phase must be completed. To review, these are:

- The Requirements Traceability Matrix has been updated.
- A Detailed Design Document has been developed and approved.
- System Security Construction Phase checklist has been completed and approved.
- Test Plans have been developed.
- A developed and tested solution, including source, object, and execution code has been accepted.
- PRR has been conducted and signed off.
- Configuration Item Index has been updated.
- Support Organization has been identified.
- QA Reviews have been conducted as documented in the QA plan.

Deployment Phase Process and Outputs

Once the PRR has been successfully completed at the end of the Construction Phase, the actual deployment activities will commence. For SFA applications, all deployment activities are the responsibility of the organization responsible for operating the application. For the majority of SFA applications, this will be the VDC. Therefore, the deployment procedures required by the VDC should be followed. For SFA applications not deployed at the VDC, the procedures of the operations organization should be followed.

Solution Acquisition Planning is conducted as needed. Solution Acquisition Planning Management is ongoing, and status reporting, risks and issues tracking continue. QA reviews and Configuration Management items are baselined and migrated to the VDC.

Transition to Support (TTS)

The purpose of Transition to Support is to plan, manage, and complete support readiness activities.

The TTS Lead monitors the transition cut over to ensure a seamless transition. A project inventory list is produced by the development organization and reviewed with the Support Organization. Also, the TTS Lead updates the Transition Readiness Review document, schedules, and conducts the review and secures Executive Sponsor sign-off once complete.

Additional activities include the establishment of Service Level Agreements (SLAs) with the operational architecture hardware and software vendors, to ensure post-deployment support will be provided. If additional funding or contractor support is needed to support the solution, then the Business Case will need to be updated by the IPT and approved by the IRB and a new Statement of Objectives will need to be created in order to award a new Task Order for the Support Phase. The processes and outputs for the Business Case, Statement of Objectives, and Task Order are addressed in the Vision Phase.

Once the system has been deployed, training may be required in order to allow the deployed solution to be fully utilized. This training may involve any number of audiences – end users, system administrators, operations and maintenance personnel, etc. The breadth and depth of training provided to each of these groups will vary by solution type, and therefore is not discussed in detail in this Guide.

The developing organization lists the latest version of controlled documents for the support organization to store when the support organization takes over maintaining the software.

System Security

In the Deployment phase, several security related activities introduced in prior phases should be brought to closure. The corrective action plan developed in the construction phase risk assessment should be implemented. Once implemented, each Corrective Action Plan (CAP) element should be dated and initialed indicating completion of the element. The CAP should then be submitted to the SSO for maintenance.

In the Construction Phase, security controls were reviewed as they are documented. During deployment, the security controls should undergo a series of tests to determine if the controls were implemented properly and effectively. Initially, a security test plan should be developed.

Additionally, at the end of the Deployment Phase, the SLC Deployment Phase Checklist should be signed off by the SSO. The checklist represents the completion of all security related activities for the Deployment Phase. The activities include:

- Documented Completion of CAP from Construction Phase
- Security Test Plan
- Security Test Results
- Final System Security Authorization Agreement (SSAA)
- Certification Letter
- Signed Accreditation Letter
- Final System Security Plan
- Final Continuity of Operation Plan
- Final Disaster Recovery Plan
- User Training Schedule
- Approved User Access Request Forms

For more information regarding the SLC Security Deployment Phase Checklist, see the System Security Process Guide.

Deployment Phase Roles and Responsibilities

The following matrix is provided as a guide to the roles and responsibilities of the key personnel that are in the Deployment Phase of the life cycle.

Title	Role	Responsibility
CIO IT SERVICES	Liaison between the VDC and the IPT.	Ensure needed VDC services are met. Notify the VDC of any planning changes identified during this phase.
CM LEAD	Manage project CM activities.	Baseline and migrate CM Item Index.
EXECUTIVE SPONSOR	Solution Sponsor.	Ensure deployment results. Also, review and approve any changes made to the Business Performance Model, Solution Acquisition Plan, Business Case and new Task Order award.
EXECUTIVE STEERING COMMITTEE	Project Review and Recommendations.	Responsible for reviews and recommendations made throughout the delivery of the solution.

Title	Role	Responsibility
IPT	Solution Development and Delivery Team.	Deploy solution. Participate in TTS.
PROJECT MANAGER	Plan and manage the acquisition project	Implement acquisition project planning process in accordance with the Solution Acquisition Plan.
QA LEAD	Plan and manage QA reviews.	Ensure that the project is performing all necessary QA activities. Act as liaison between the SFA QA Team and the project team. The QA Project Manager is typically a member of the IPT and/or contracting team.
SYSTEM SECURITY OFFICER	Review and make security recommendations.	Work with the IPT Project Manager and others to ensure that the solution Preliminary Design meets the SFA's security requirements and complete all security documentation requirements.
TTS LEAD	Transition the solution to support.	Manage the transition process in preparation for the Support Phase.

Deployment Phase Exit Criteria

In the Deployment Phase, the rollout of the solution to the user community security and transition to support activities were discussed. Prior to the completion of the Deployment Phase, the following exit criteria must be met:

Critical:

- Solution has been successfully deployed.
- Project inventory list is baselined.
- TTS readiness review is completed.
- Transition sign-off is completed.
- SLC Security Deployment Phase checklist is completed and approved.
- System Security Plan is complete.
- Configuration Item Index has been baselined and migrated.

Recommended:

- Applicable training has been conducted.
- Arrangements have been made with the organization(s) responsible for operating and maintaining the solution (SLAs have been established).

- QA Reviews have been conducted as documented in the QA plan.

Deployment Phase Job Aids

The following job aids are available in the Process Guides:

- SLC Security Deployment Phase Checklist

6. Support Phase

Phases	Vision	Definition	Construction	Deployment	Support
Results	Problem Assessment	System Requirements	Detailed Design	Deployed Solution	**Production Services**
	Solution Recommendation	Preliminary Design	Accepted Solution		

A summary of SLC recommendations for use during the Support Phase is contained within the following matrix.

Phase Area	SLC Recommendations
OBJECTIVE	Provide operational and maintenance support for the deployed solution.
ENTRY CRITERIA (Sample provided in Appendix A)	• Solution has been successfully deployed. • Project inventory list is baselined. • TTS readiness review is completed. • Transition sign-off is completed. • SLC Security Deployment Phase checklist is completed and approved. • System Security Plan is complete. • Configuration Item Index has been baselined and migrated.

Phase Area	SLC Recommendations
PROCESS AND OUTPUTS	**Solution Acquisition Project Management** • Closeout activities • Post Implementation Review **System Security** • Security Control Review • SLC Security Support Phase Checklist **Transition to Support** • Completed Transition Readiness Checklist • IPT Closure **Operations and Maintenance** • Plan Operations and Maintenance Task Order Activities **Configuration Management** • Updated Configuration Item Index
ROLES AND RESPONSIBILITIES	**The following roles will participate in this phase, and are defined in the Support Roles and Responsibilities section:** CIO IT Services CM Lead Project Manager System Manager System Security Officer
EXIT CRITERIA	• Solution is retired. • SLC Security Support Phase Checklist completed and approved.
JOB AIDS	SLC Security Support Phase Checklist

Support Phase Objective

The objective of the Support Phase is to smoothly operate the new business capabilities that were created and deployed in the Deployment Phase of the SLC Process Guide. The work in this phase must also meet the formal service targets and metrics established earlier in the life cycle. In addition, it must provide mechanisms for providing feedback for improvements based on

measurements of actual performance against those targets. Given these guidelines, the Support Phase applies to all information systems and related system engineering activities associated with a deployed solution. This may include hardware, COTS products, and/or custom software, and documentation. In particular, the focus of this phase is an enterprise view of maintenance and support. In addition, the SFA QA Manager can and the QA Project Manager should assess the need for QA reviews throughout the support phase. Any QA plans should be documented in a QA plan.

Support Phase Entry Criteria

Before work in the Support Phase can begin, the exit criteria from the Deployment Phase must be completed. To review, these are:

- Solution has been successfully deployed.
- Project inventory list is baselined.
- TTS readiness review is completed.
- Transition sign-off is completed.
- SLC Security Deployment Phase checklist is completed and approved.
- System Security Plan is complete.
- Configuration Item Index has been baselined and migrated.

Support Phase Process and Outputs

When the Support Phase begins, the solution has been defined, created, and deployed. Now steps need to be taken to ensure that the solution continues to be a beneficial, efficient, and utilized product. This phase of the life cycle focuses on the maintenance and support of the deployed solution. However, the support organization and personnel within the VDC perform most of the activities within this phase outside of the IPT. Therefore, the topics covered in this section are only briefly touched on.

Solution Acquisition Project Management

Once the solution has been deployed, the IPT transitions responsibility of the solution over to the sponsor and the operating organization close-out activities are also performed. A lessons learned document may be created at this time that outlines overall issues that arose during the development and implementation of the solution, and this should be made available to other IPTs to facilitate knowledge sharing among SFA applications.

The operating organization is responsible for ensuring that the deployed solution continues to meet the performance objectives stated in the Business Performance Model. A Post Implementation Review occurs approximately six months after a system goes into production. *See the IT Investment Operating Procedures.*

System Security

The Support Phase continues throughout the life of the system. Once the system is deployed, several security activities and documents should be maintained. The System Security Plan should be continually reviewed and updated as the system undergoes major changes; that is, undergoes changes significant enough to alter the security posture of the system. OMB Circular A-130 Appendix III requires a review of security controls every three years or upon major system change. SFA recommends these reviews occur every year due to the rate of system change occurring at SFA. Also, the Government Information Security Reform Act requires a program and system review every year. The guidance to be used for this review can be found in the NIST Self Assessment Guide for Information Technology Systems. The self-assessment review will assist the System Security Officer and system owner determine security control priorities based on weaknesses in policy, procedures, implementation, testing, and integration.

Additionally, during the Support Phase, the SLC Support Phase Checklist should be signed off by the SSO. The checklist represents the completion of all security related activities for the Support Phase. The activities include:

- Re-certified and accredited SSAA
- Documented completion of test results
- Updated Operation Procedures
- Updated Testing Results

For more information regarding the SLC Security Support Phase Checklist, see the System Security Process Guide.

Transition to Support

Before the solution can be supported, the IPT needs to ensure that the necessary arrangements have been made to ensure a smooth transition to supporting the solution. The organization responsible for operating and maintaining the application (the support organization and the VDC, for most SFA applications) needs to be extensively involved in the transition to support effort. Please refer to the Transition Readiness Checklist for the steps that need to be followed during this transition.

Operations and Maintenance

If a separate operations and maintenance task order needs to be created, see the Vision Phase to plan for new task order activities.

One area of consideration is the responsibility of the operating organization involves providing Help Desk services. A Help Desk is a group that is implemented to support a user community with all issues as they relate to specific applications or business functions. Help Desks can have several different constituents. Many may come from the SFA community, and others may include external customers, such as students and schools. It is at the discretion of the organization as to

whether the help desk be dedicated to a single application or multiple applications. This often is dependent on the complexity of the application, number of users, and cost.

Another factor in deciding whether or not to set up a Help Desk is that they can serve as a way of gathering information from the user community on the types of issues faced in introducing the solution. Therefore, metrics from the Help Desk can be used to guide the SFA in developing systems that are better received as time goes on. A Help Desk can be used as a way of capturing information on the types of enhancements and modifications respective user communities are interested in receiving.

Support Phase Roles and Responsibilities

The following matrix is provided as a guide to the roles and responsibilities of the key personnel that are in the Support Phase of the life cycle.

Title	Role	Responsibility
CIO IT SERVICES	Liaison between the VDC and the System Manager.	Identify needed VDC services. Notify the VDC of any operations related changes or changes to the solutions.
CM LEAD	Manage operational CM activities.	Take over the update and maintenance of the CM Item Index. Manage Configuration Library as new releases are implemented.
PROJECT MANAGER	Manage closeout activities.	Ensure that project management documentation is completed and published for the System Manager. Update Solution Acquisition Plan.
SYSTEM MANAGER	Own Solution.	Responsible for maintaining the system.
SYSTEM SECURITY OFFICER	Manage maintenance of security activities.	Manage periodic reviews of security controls, plans and documentation. Schedule annual program and security review.

Support Phase Exit Criteria

The Support Phase will continue until the system is retired or until a new solution is envisioned and the life cycle begins again.

Support Phase Job Aids

The following job aids are available in the Process Guides:

- SLC Security Support Phase Checklist